Knowledge, Attitude, and Practices on Sunscreen Use Among Acne Vulgaris Patients: A Cross-Sectional Study in the National Capital Region and Region 4A

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ABSTRACT

Background: Acne patients often use medications, either over the counter or prescribed by dermatologists, to manage their condition. Dermatologists frequently include sunscreens as part of these treatment plans alongside acne medications. This research aims to determine the level of knowledge, attitudes, and practices regarding sunscreen use among respondents who are confirmed acne patients and have been prescribed sunscreen as part of their treatment regimen.

Objective: This research examines the current knowledge, attitudes, and practices of acne patients regarding sunscreen use as part of their acne treatment regimen, considering demographic factors. The knowledge, attitudes, and practices of the respondents will be compared across different age groups, genders, and employment statuses.

Methods: This study purposefully collected data from patients with active acne on the use of sunscreens alongside acne medications. The sample included males and females aged 18-27, 28-40, and 40+ residing in either the National Capital Region or the CALABARZON Region, with 105 respondents in each group. Data was gathered using a validated Knowledge, Attitudes, and Practices (KAP) questionnaire, consisting of 30 questions that had undergone reliability testing via Cronbach's alpha. Responses were recorded on a 3-point Likert scale to model the interaction of KAP variables. The research material was distributed through Google Forms in June 2024. Data analysis was conducted using R, specifically the psych package, and the Kruskal-Wallis test was applied to compare groups, determining if significant differences existed among them. This test was incorporated within RStudio.

Results: Findings indicated that respondents generally demonstrated a high level of understanding regarding the importance of sunscreen when used alongside acne treatments, particularly acknowledging its role in preventing acne scarring and reducing skin sensitivity caused by treatment products. Additionally, attitudes toward sunscreen use were largely positive, with respondents rejecting common misconceptions about sunscreen. However, actual sunscreen application practices were moderate, with adherence levels varying across the sample. Significant differences in sunscreen use were observed based on employment status, gender, and age.

Conclusion: Acne patients in this study had a high level of knowledge and a positive attitude on the use of sunscreen together with their acne medications. Consistency in sunscreen application was moderate. Unemployed respondents were more receptive to external influences regarding sunscreen use. Female respondents were more informed and proactive than male respondents. Younger respondents were more influenced by social networks. This research highlights the need for continued education on the benefits of sunscreen use to be able to achieve an effective acne vulgaris management.

Keywords: Knowledge, Attitude, Practices, Acne, Sunscreen

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INTRODUCTION

Acne vulgaris is among the most prevalent skin disorders treated by dermatologists. It is a multifactorial, chronic inflammatory condition of the pilosebaceous units, driven by four main pathogenetic mechanisms: increased sebum production, follicular hyperkeratinization, *Cutibacterium acnes* (C. acnes) colonization, and inflammatory byproducts.

A deeper understanding of acne pathogenesis, along with the availability of new treatments to complement existing therapies, can significantly enhance outcomes for acne management (Rathi, 2011). Acne patients often experience cosmetic disfigurement, which can lead to depression, anxiety, and thoughts of self-harm (Cherynshov, 2024). Acne impacts physical, psychiatric, and psychosocial well-being, thus affecting quality of life (Tan, 2021). The primary objective of dermatologists is to develop a treatment plan tailored to each patient's skin type, acne severity, and the availability of both prescription medications and over-the-counter skincare products, facilitating a patient-specific approach to managing acne vulgaris. Comprehensive acne vulgaris management involves four main components based on the needs of acne-prone and acne-treated skin, as well as current understanding of preserving the structural and functional integrity of the epidermal barrier: (1) cleansing, (2) medicating, (3) moisturizing, and (4) photoprotection (Del Rosso et al., 2015).

Photoprotection, though often overlooked, can significantly improve acne outcomes. Numerous guidelines recommend photoprotection for acne patients. A consensus among experts on holistic skincare for acne advises using broad-spectrum sunscreens with SPF ≥ 30 to mitigate photosensitivity and photodermatitis from topical or systemic treatments. Additional benefits of sunscreen include skin cancer prevention, reduced irritation from acne medications, prevention of post-inflammatory hyperpigmentation, concealing acne scars, UV and visible light protection, and shorter recovery times following treatments like chemical peels and lasers (Piquero-Casals et al., 2023).

Thanks to advancements in technology, sunscreens now come in formulations tailored for acne-prone skin: broad-spectrum SPF ≥ 30, water-based, lightweight, fast-absorbing, and cosmetically pleasing. They are also non-comedogenic, often enriched with antioxidants to reduce oxidative stress, tinted for coverage, sebo-regulating, and contain anti-inflammatory properties (Piquero-Casals et al., 2023). As sunscreen formulations evolve, so does the influence of social media platforms, which play a significant role in disseminating both accurate and misleading information on sunscreen use. A recent study on sunscreen-related tweets found that while 89% of accurate tweets were positively inclined toward sunscreen, over half (54%) of inaccurate tweets had a negative sentiment and, notably, received more engagement than accurate tweets (Fazel et al., 2021).

This research aims to assess the knowledge, attitudes, and practices of acne vulgaris patients regarding their sunscreen use.

METHODS

This research was conducted collaboratively by proponents from various institutions, with some based in the CALABARZON Region and others in the National Capital Region (NCR).

Sampling Method

The study employed purposive sampling, targeting patients diagnosed with acne by dermatologists who were prescribed sunscreen as part of their treatment regimen. The sample size was determined through power analysis (Cohen's F), yielding 105 samples per group, resulting in a total of 210 samples across two groups: one from CALABARZON (Region 4A) and the other from the National Capital Region (NCR). The power analysis was conducted using RStudio and the 'pwr' package (Champley et al., 2022).

Research Instrument

The questionnaire was structured with ten questions each on knowledge, attitude, and practices, designed to assess respondents' understanding, outlook, and usage of sunscreen. The initial section included screening questions to determine respondents' eligibility to proceed with the main survey.

Table 1. Filtering Questions in the Questionnaire.

Questions	Available Response
1. Do you have active acne?	Yes / No
2. Do you have other skin disorders aside from acne?	Yes / No
3. Did a dermatologist diagnose you with acne?	Yes / No
4. Did a dermatologist diagnose you with drug-induced acne?	Yes / No
5. Were you prescribed sunscreen in addition to your acne medications?	Yes / No
6. Are you currently pregnant?	Yes / No
7. Do you have any condition, ailment, disorder, disease, or known allergies that prevent the use of acne medications or sunscreen?	Yes / No
8. Do you know if the sunscreen you use is oil-free or water-based?	Yes / No
9. Do you give your consent to use your data for this study?	Yes (Proceed to the Questions) /No (End this survey).

Respondents were selected based on their answers to the screening questions. It was essential for respondents to answer "yes" to filtering questions one (1) and three (3), as these aligned with the study's focus. In the final question, respondents were asked to provide their consent to participate in the study.

Following the screening questions, the research instrument gathered demographic information from the respondents. Table 2 presents the demographic questions used in the study.

Table 2. Demographic Questions in the Questionnaire.

Questions	Available Response
Age	18 to 27, 28 to 40, 41 and above
Gender	Male, Female
Educational Attainment	Elementary, Junior High School, Senior High School, College Level, and Graduate Studies
Employment Status	Employed and Unemployed
Residency	National Capital Region (NCR), CALABARZON (Region 4A)

In addition to the questions listed in Table 2, respondents were also asked for their full name, though providing it was optional and encrypted to protect their identity in compliance with the Data Privacy Act of 2012 (RA 10173, Philippines). Information on occupation (for those employed), reason for unemployment, specific cities in NCR, and provinces within CALABARZON was also collected but will not be disclosed in this study to adhere to RA 10173 guidelines.

Table 3 displays the questions designed to assess respondents' knowledge regarding the use of sunscreen.

Table 3. Knowledge Questions in the Questionnaire.

Questions	Likert Scale (Available Responses)
1. I understand that using acne treatment products makes the skin more sensitive to UV rays.	Yes (3 - Point), No (2 – Point), & I don't know (1 – Point).
2. I understand that prescriptions for acne treatment often include sunscreens.	Yes (3 - Point), No (2 – Point), & I don't know (1 – Point).
3. I know that using acne treatment products alongside sunscreens helps maintain healthy skin.	Yes (3 - Point), No (2 – Point), & I don't know (1 – Point).
4. I know that acne and acne scars can heal faster with the combined use of acne treatment products and sunscreens.	Yes (3 - Point), No (2 – Point), & I don't know (1 – Point).
5. I know that sunscreens can help prevent acne scars from becoming darker.	Yes (3 - Point), No (2 – Point), & I don't know (1 – Point).
6. I know that tinted sunscreens can help conceal acne.	Yes (3 - Point), No (2 – Point), & I don't know (1 – Point).
7. I know that certain sunscreens can trigger acne.	Yes (3 - Point), No (2 – Point), & I don't know (1 – Point).
8. I know that some sunscreens are non-comedogenic and suitable for acne-prone skin.	Yes (3 - Point), No (2 – Point), & I don't know (1 – Point).
9. I know that oil-free sunscreens can be used for acne-prone skin.	Yes (3 - Point), No (2 – Point), & I don't know (1 – Point).
10. I know that water-based sunscreens can be used for acne-prone skin.	Yes (3 - Point), No (2 – Point), & I don't know (1 – Point).

The questions in Table 3 were designed to assess the respondents' level of knowledge about sunscreen. The response options provided in the questionnaire were: (a) Yes, (b) No, and (c) I don't know, incorporated within a Likert scale framework.

Table 4. Attitude Questions in the Questionnaire.

Questions	Likert Scale (Available Responses)
1. I am influenced by popular media advertisements regarding the use of sunscreens for my acne.	Agree (3 – Point), Neutral (2 – Point), & Disagree (1 – Point).
2. I am influenced by my family and friends regarding the use of sunscreens for my acne.	Agree (3 – Point), Neutral (2 – Point), & Disagree (1 – Point).
3. I am unlikely to use sunscreen because I am usually in too much of a hurry to apply it.	Agree (3 – Point), Neutral (2 – Point), & Disagree (1 – Point).
4. I am unlikely to use sunscreen because I worry it will clog my pores.	Agree (3 – Point), Neutral (2 – Point), & Disagree (1 – Point).
5. I am unlikely to buy sunscreens because I have oily skin.	Agree (3 – Point), Neutral (2 – Point), & Disagree (1 – Point).
6. I am unlikely to use sunscreens because they feel sticky.	Agree (3 – Point), Neutral (2 – Point), & Disagree (1 – Point).
7. I am unlikely to buy sunscreens in addition to my acne treatment products because it's an extra expense.	Agree (3 – Point), Neutral (2 – Point), & Disagree (1 – Point).
8. I am unlikely to use sunscreens because they leave a white cast on my face.	Agree (3 – Point), Neutral (2 – Point), & Disagree (1 – Point).
9. I am unlikely to use sunscreens because I worry, they will worsen my acne.	Agree (3 – Point), Neutral (2 – Point), & Disagree (1 – Point).
10. I am unlikely to use sunscreens because I consider them less important than my acne treatment products.	Agree (3 – Point), Neutral (2 – Point), & Disagree (1 – Point).

Table 4 presents the questions related to respondents' attitudes, with available responses being (a) Agree, (b) Neutral, and (c) Disagree. These responses were scaled using a Likert scale ranging from 1 to 3, with one (1) as the lowest and three (3) as the highest. The final section of the questionnaire included questions related to practices, as shown in Table 5.

Table 5. Practice Questions in the Questionnaire.

Questions	Likert Scale (Available Responses)
1. I follow my dermatologist's prescriptions for sunscreens along with my acne treatment products.	Always (3 – Point), Sometimes (2 – Point), Never (1 – Point)
2. I purchase sunscreens that are recommended by my dermatologist.	Always (3 – Point), Sometimes (2 – Point), Never (1 – Point)
3. I buy sunscreens that are popular on social media.	Always (3 – Point), Sometimes (2 – Point), Never (1 – Point)
4. I choose sunscreen ingredients that help prevent acne.	Always (3 – Point), Sometimes (2 – Point), Never (1 – Point)
5. I select specific brands of sunscreens.	Always (3 – Point), Sometimes (2 – Point), Never (1 – Point)
6. I continue to use sunscreens even when I have acne.	Always (3 – Point), Sometimes (2 – Point), Never (1 – Point)
7. I wear makeup alongside my acne treatment products and sunscreens.	Always (3 – Point), Sometimes (2 – Point), Never (1 – Point)
8. I use moisturizer together with my acne treatment products and sunscreens.	Always (3 – Point), Sometimes (2 – Point), Never (1 – Point)
9. I apply only a light layer of sunscreen because I have oily skin.	Always (3 – Point), Sometimes (2 – Point), Never (1 – Point)
10. I stop using sunscreens once my acne is under control.	Always (3 – Point), Sometimes (2 – Point), Never (1 – Point)

The questions related to respondents' practices offered the following response options: (a) Always, (b) Sometimes, and (c) Never. These responses were also assigned point values, which will be used to calculate the mean score and standard error, helping to identify the overall response trends among the respondents.

Distribution of Research Material

The research material was distributed via Google Forms, accessed through a QR code displayed in the dermatology clinics of the collaborating dermatologists.

Patients visiting the clinics were invited to scan the QR code to complete the survey, and upon completion, they received a free sample of sunscreen. For respondents whose smartphones were incompatible with QR scanning, a shortened URL was provided as an alternative. Data collection was conducted in the CALABARZON Region (Region 4A) and the National Capital Region (Metro Manila).

Statistical Treatment

Respondents' answers were converted to their numerical equivalents to calculate and present the mean score and standard error together.

Table 6. Interpretation of Response based on Mean Score.

I. Knowledge Question Interpretation	Mean Score Range
Yes	2.35-3.00
No	1.68-2.34
I don't know	1.00-1.67
II. Attitude Question Interpretation	**Mean Score Range**
Agree	2.35-3.00
Neutral	1.68-2.34
Disagree	1.00-1.67
III. Practice Question Interpretation	**Mean Score Range**
Always	2.35-3.00
Sometimes	1.68-2.34
Never	1.00-1.67

The table above presents the interpretation of respondents' answers based on mean scores, which were used to support the study's arguments and conclusions. The variables—(a) Age, (b) Gender, and (c) Employment Status—will be tested against respondents' knowledge, attitudes, and practices. The Kruskal-Wallis test will assess differences across age groups, gender, and employment status. Cronbach's alpha was calculated using the R package psych (Revelle, 2024) in RStudio to ensure reliability.

RESULTS AND DISCUSSION

The demographic data of the respondents was based on a total of 105 samples from each of the two groups. Table 7 provides an overview of the respondents' characteristics.

Table 7. Demographic Data of the Study

Variables	Sample (n)	Percentage (%)
No. of Respondents	210	100%
GENDER		
Female	162	77.14 %
Male	48	22.86 %
AGE GROUP		
18 years old to 27 years old	118	56.19 %
28 years old to 40 years old	70	33.33 %
41 years old and above	22	10.48 %
HIGHEST EDUCATIONAL ATTAINMENT		
Elementary	0	0.00 %
Junior High School	8	3.81 %
Senior High School	17	8.10 %
College Level	144	68.57 %
Graduate Studies	41	19.52 %
EMPLOYMENT		
Employed	119	56.67%
Unemployed	91	43.33%

The demographic data from the study on knowledge, attitude, and practices of acne patients regarding sunscreen use as part of their acne treatment regimen reveals a sample of 210 respondents, predominantly female (77.14%) compared to male (22.86%). Most respondents fall within the younger age groups, with 56.19% aged 18 to 27 years old and 33.33% aged 28 to 40 years old, while only 10.48% are aged 41 years or older. This age distribution suggests that younger individuals, who may have higher self-awareness or sensitivity to skincare, are more likely to engage in acne treatment that includes sunscreen use.

Educational attainment among participants is predominantly at higher education levels, with 68.57% having completed college and an additional 19.52% holding graduate degrees. A minor portion (3.81%) reported junior high school as their highest level of education, with no participants indicating elementary-level attainment. This educational profile suggests a potentially higher level of health literacy or greater awareness about acne treatment and skin health, which may influence participants' attitudes and practices regarding sunscreen use.

In terms of employment status, 56.67% of respondents are employed, while 43.33% are unemployed. This relatively high employment rate may be linked to greater access to resources, enabling individuals to seek dermatological care and maintain regular sunscreen use as part of their prescribed acne treatment regimen. Employed respondents may have the financial stability and routines conducive to adhering to such skincare practices, which are essential for effective acne management.

Table 8. Result of Knowledge Questions.

Questions Related to Knowledge	Alpha	Std. Alpha	Score (Mean ± SE)	Interpretation
1. I understand that using acne treatment products makes the skin more sensitive to UV rays.	0.97	1.00	2.65 ± 0.0459	YES
2. I understand that prescriptions for acne treatment often include sunscreens.	0.97	1.00	2.84 ± 0.0321	YES
3. I know that using acne treatment products alongside sunscreens helps maintain healthy skin.	0.97	1.00	2.94 ± 0.0217	YES
4. I know that acne and acne scars can heal faster with the combined use of acne treatment products and sunscreens.	0.97	1.00	2.76 ± 0.0402	YES
5. I know that sunscreens can help prevent acne scars from becoming darker.	0.97	1.00	2.74 ± 0.0393	YES
6. I know that tinted sunscreens can help conceal acne.	0.97	1.00	2.74 ± 0.0407	YES
7. I know that certain sunscreens can trigger acne.	0.97	1.00	2.71 ± 0.0435	YES
8. I know that some sunscreens are non-comedogenic and suitable for acne-prone skin.	0.97	1.00	2.64 ± 0.0484	YES
8. I know that some sunscreens are non-comedogenic and suitable for acne-prone skin.	0.97	1.00	2.64 ± 0.0484	YES
9. I know that oil-free sunscreens can be used for acne-prone skin.	0.97	1.00	2.38 ± 0.0571	YES
10. I know that water-based sunscreens can be used for acne-prone skin.	0.97	1.00	2.39 ± 0.0582	YES
KNOWLEDGE SCORE			2.68 ± 0.0427	**Knowledgeable**

Table 8 displays the results of a knowledge assessment on the use of sunscreen alongside acne treatment products. The Alpha and Standardized Alpha values, both at 0.97, demonstrate a high level of reliability in the responses, indicating that participants consistently understood the questions related to sunscreen and acne management. This strong reliability enhances the credibility of the knowledge assessment results.

The mean knowledge score of 2.68 ± 0.0427 indicates that respondents possess a strong understanding of the importance of sun protection in conjunction with acne treatments. This score suggests that respondents are generally aware of the benefits of using sunscreen alongside acne treatments, likely integrating this knowledge into their skincare routines. The question addressing increased skin sensitivity to UV rays due to acne treatment products (Mean = 2.65) reveals awareness among respondents of the risks associated with UV exposure during acne management. Furthermore, a mean score of 2.84 for awareness that sunscreens are often prescribed alongside acne treatments suggests a solid understanding of integrative skincare, emphasizing sun protection as a crucial element in acne treatment regimens.

Respondents' high scores regarding the combined use of acne treatments and sunscreens (Mean = 2.94) indicate a strong recognition of the synergistic effects that these products can have on skin health. This score reflects a holistic view of acne treatment, where sun protection is seen as essential to effective management. Participants also demonstrated knowledge of sunscreen's role in preventing dark acne scars (Mean = 2.74) and the potential for certain sunscreens to exacerbate acne (Mean = 2.71), showing a nuanced understanding of the need for acne-appropriate sunscreen choices.

Questions about non-comedogenic (Mean = 2.64), oil-free (Mean = 2.38), and water-based sunscreens (Mean = 2.39) also received affirmative responses. Although mean scores for oil-free and water-based sunscreens were slightly lower, they still suggest a general awareness of appropriate sunscreen types for acne-prone skin.

Overall, findings in Table 8 indicate a high level of knowledge among respondents regarding the use of sunscreens with acne treatments. This includes an understanding of increased UV sensitivity, prevention of acne-related scarring, and the importance of selecting suitable sunscreen products, underscoring an informed and holistic approach to acne management among participants.

Table 9. Result of Attitude Questions

Questions Related to Attitude	Alpha	Std. Alpha	Score (Mean ± SE)	Interpretation
1. I am influenced by popular media advertisements regarding the use of sunscreens for my acne.	0.95	1.00	2.20 ± 0.0481	Neutral
2. I am influenced by my family and friends regarding the use of sunscreens for my acne.	0.96	1.00	2.28 ± 0.0502	Neutral
3. I am unlikely to use sunscreen because I am usually in too much of a hurry to apply it.	0.95	1.00	1.45 ± 0.0465	Disagree
4. I am unlikely to use sunscreen because I worry it will clog my pores.	0.97	1.00	1.40 ± 0.0449	Disagree
5. I am unlikely to buy sunscreens because I have oily skin.	0.97	1.00	1.42 ± 0.0454	Disagree
6. I am unlikely to use sunscreens because they feel sticky.	0.95	1.00	1.73 ± 0.0546	Neutral
7. I am unlikely to buy sunscreens in addition to my acne treatment products because it's an extra expense.	0.94	1.00	1.41 ± 0.0428	Disagree
8. I am unlikely to use sunscreens because they leave a white cast on my face.	0.95	1.00	1.59 ± 0.0516	Disagree
9. I am unlikely to use sunscreens because I worry, they will worsen my acne.	0.96	1.00	1.55 ± 0.0499	Disagree
10. I am unlikely to use sunscreens because I consider them less important than my acne treatment products.	0.98	1.00	1.30 ± 0.0399	Disagree
ATTITUDE SCORE			1.63 ± 0.0474	Disagree

Table 9 presents the results of an attitude assessment concerning sunscreen use in conjunction with acne treatments. The reliability coefficients (Alpha and Standardized Alpha) range from 0.94 to 0.98, indicating a high consistency in responses. The overall attitude score of 1.63 ± 0.0474, within the "disagree" range, suggests that respondents generally do not hold negative attitudes toward sunscreen use, which is encouraging for promoting effective skincare practices.

Examining specific attitude-related questions, responses reveal a neutral influence from popular media advertisements (Mean = 2.20) and personal networks, such as family and friends (Mean = 2.28), on sunscreen use. This neutrality indicates that respondents may rely less on external sources for their skincare decisions, suggesting a degree of autonomy in their choices. Importantly, many respondents disagree with common misconceptions about sunscreen use. For example, they do not feel too rushed to apply sunscreen (Mean = 1.45) nor believe that sunscreen will clog their pores (Mean = 1.40), reflecting a positive outlook and awareness of sunscreen's value in their routines.

Additionally, respondents largely disagree with concerns that oily skin (Mean = 1.42) or a sticky feel (Mean = 1.73) would prevent them from using sunscreen. They are also not significantly affected by worries that sunscreen might worsen acne (Mean = 1.55) or leave a white cast (Mean = 1.59), demonstrating an informed and practical approach that values sun protection alongside acne treatment. Furthermore, respondents express a willingness to bear additional costs for sunscreen, disagreeing with the idea that it is an unnecessary expense beyond acne treatments (Mean = 1.41). They also regard sunscreen as important, not viewing it as less essential than their acne treatments (Mean = 1.30).

In summary, the results suggest a generally positive attitude among respondents toward incorporating sunscreen in their skincare regimens. This positive outlook could promote consistent sunscreen use, essential for skin protection during acne treatment. The findings highlight the importance of reinforcing these positive attitudes through educational efforts, encouraging a holistic skincare approach that effectively integrates sun protection.

Table 10. Result of Practice Questions.

Questions Related to Practices	Alpha	Std. Alpha	Score (Mean ± SE)	Interpretation
1. I follow my dermatologist's prescriptions for sunscreens along with my acne treatment products.	0.97	1.00	2.76 ± 0.0337	Always
2. I purchase sunscreens that are recommended by my dermatologist.	0.97	1.00	2.61 ± 0.0389	Always
3. I buy sunscreens that are popular on social media.	0.97	1.00	1.68 ± 0.0352	Sometimes
4. I choose sunscreen ingredients that help prevent acne.	0.97	1.00	2.47 ± 0.0428	Always
5. I select specific brands of sunscreens.	0.97	1.00	2.60 ± 0.0371	Always
6. I continue to use sunscreens even when I have acne.	0.97	1.00	2.72 ± 0.0354	Always
7. I wear makeup alongside my acne treatment products and sunscreens.	0.97	1.00	2.12 ± 0.0549	Sometimes
8. I use moisturizer together with my acne treatment products and sunscreens.	0.97	1.00	2.63 ± 0.0361	Always

9. I apply only a light layer of sunscreen because I have oily skin.	0.97	1.00	2.04 ± 0.0468	Sometimes
10. I stop using sunscreens once my acne is under control.	0.97	1.00	1.34 ± 0.0392	Never
PRACTICES SCORE			2.30 ± 0.0400	**Sometimes**

Table 10 summarizes the sunscreen use practices among participants undergoing acne treatment. The high reliability coefficients (Alpha and Standardized Alpha) of 0.97 across all items indicate strong consistency in responses. The overall practice score of 2.30 ± 0.0400, within the "sometimes" category, suggests that while participants engage in some sunscreens use practices, there is still room to enhance adherence to recommended behaviors.

Examining specific practices, participants reported "always" following their dermatologist's sunscreen prescriptions alongside acne treatments (Mean = 2.76) and purchasing sunscreens recommended by their dermatologist (Mean = 2.61). These responses reflect a strong adherence to professional advice, underscoring the influence of dermatologist recommendations on skincare routines. Participants also reported consistently choosing sunscreen ingredients that help prevent acne (Mean = 2.47) and regularly selecting specific sunscreen brands (Mean = 2.60), indicating a mindful approach to product selection.

However, some practices showed variability. For example, participants "sometimes" buy sunscreens popularized on social media (Mean = 1.68) and "sometimes" wear makeup in combination with their acne treatment products and sunscreen (Mean = 2.12). This variability suggests that while social media may impact product choices, it does not significantly drive their overall sunscreen practices. Additionally, participants "sometimes" apply only a light layer of sunscreen due to oily skin (Mean = 2.04), indicating a cautious approach to application.

Notably, participants indicated that they "never" stop using sunscreen once their acne is under control (Mean = 1.34), reflecting an understanding of the importance of continued sun protection for preventing further skin damage. This perspective may contribute to a sustained commitment to sun safety beyond active acne treatment.

Overall, while the findings showed a foundation of positive sunscreen practices among individuals with acne, the "sometimes" rating points to potential barriers to consistent application and adherence.

Table 11. Comparing the Response of Employed and Unemployed Respondents.

Item	Employed Score	Unemployed Score	Kruskal Walli	P-Value
K1. I understand that using acne treatment products makes the skin more sensitive to UV rays.	2.713 ± 0.065	2.663 ± 0.069	18.514	<0.01
K2. I am influenced by my family and friends regarding the use of sunscreens for my acne.	2.842 ± 0.050	2.901 ± 0.041	24.842	<0.01
K3. I know that using acne treatment products alongside sunscreens helps maintain healthy skin.	2.931 ± 0.035	2.950 ± 0.029	73.730	<0.01

A2. I am influenced by my family and friends regarding the use of sunscreens for my acne.	2.089 ± 0.077	2.307 ± 0.074	15.407	<0.01
A3. I am unlikely to use sunscreen because I am usually in too much of a hurry to apply it.	1.406 ± 0.071	1.436 ± 0.067	24.706	<0.01
A5. I am unlikely to buy sunscreens because I have oily skin.	1.366 ± 0.066	1.426 ± 0.069	17.082	<0.01
P2. I purchase sunscreens that are recommended by my dermatologist.	2.624 ± 0.054	2.673 ± 0.058	21.194	<0.01
P3. I buy sunscreens that are popular on social media.	1.584 ± 0.053	1.673 ± 0.058	19.460	<0.01
P6. I continue to use sunscreens even when I have acne.	2.673 ± 0.058	2.693 ± 0.054	28.622	<0.01

In terms of knowledge, both employed and unemployed respondents showed a strong understanding of sunscreen use with acne treatment, though unemployed respondents consistently scored slightly higher. For example, unemployed respondents indicated a greater influence from family and friends on their sunscreen use (Mean = 2.901) compared to employed respondents (Mean = 2.842) and demonstrated a slightly stronger understanding of sunscreen's role in supporting skin health alongside acne treatments (Mean = 2.950 vs. 2.931). These results suggest that unemployed respondents may be more receptive to social and informational influences regarding sunscreen use.

For attitudes, unemployed respondents again showed slightly higher scores, indicating a greater likelihood of being influenced by family and friends on sunscreen use (Mean = 2.307) than employed respondents (Mean = 2.089). Unemployed respondents also displayed a marginally higher tendency to cite oily skin as a reason to avoid purchasing sunscreens (Mean = 1.426 vs. 1.366). However, both groups similarly disagreed with statements suggesting inconvenience as a barrier to sunscreen use, reflecting shared positive attitudes toward incorporating sunscreen.

Regarding practices, unemployed respondents reported more frequent purchases and use of dermatologist-recommended sunscreens (Mean = 2.673) than employed respondents (Mean = 2.624). They also showed a greater tendency to buy sunscreens popularized on social media (Mean = 1.673) and were more consistent in sunscreen use even when actively managing acne (Mean = 2.693). These findings suggest that unemployed respondents may be more regular in sunscreen application and more open to popular trends.

Overall, the differences between employed and unemployed respondents suggest that unemployment may be associated with slightly higher engagement in social influences and recommended sunscreen practices. This pattern indicates that unemployed individuals might be more receptive to external guidance and social endorsements of sunscreen use. Nonetheless, the overall scores between both groups remain similar, showing that employment status, while impactful, does not significantly alter the high levels of knowledge and generally positive practices regarding sunscreen use in acne treatment among respondents.

Table 12. Comparing the Response of Male and Female Respondents

Item	Male	Female	Kruskal Wallis (X2)	P-Value
K1. I understand that using acne treatment products makes the skin more sensitive to UV rays.	2.595 ± 0.087	2.722 ± 0.072	16.28	<0.01
K2. I understand that prescriptions for acne treatment often include sunscreens.	2.709 ± 0.075	2.873 ± 0.055	28.13	<0.01
K4. I know that acne and acne scars can heal faster with the combined use of acne treatment products and sunscreens.	2.772 ± 0.067	2.671 ± 0.080	19.43	<0.01
A4. I am unlikely to use sunscreen because I worry it will clog my pores.	1.544 ± 0.086	1.316 ± 0.069	23.49	<0.01
A9. I am unlikely to use sunscreens because I worry, they will worsen my acne.	1.595 ± 0.093	1.405 ± 0.080	21.16	<0.01
A10. I am unlikely to use sunscreens because I consider them less important than my acne treatment products.	1.380 ± 0.079	1.165 ± 0.052	19.84	<0.01
P4. I choose sunscreen ingredients that help prevent acne.	2.367 ± 0.079	2.532 ± 0.067	16.57	<0.01
P5. I select specific brands of sunscreens.	2.494 ± 0.072	2.646 ± 0.060	21.06	<0.01
P10. I stop using sunscreens once my acne is under control.	1.418 ± 0.073	1.241 ± 0.058	19.76	<0.01

Table 12 compares male and female respondents' knowledge, attitudes, and practices related to sunscreen use, revealing statistically significant differences ($p < 0.01$) between the two groups.

In terms of knowledge, female respondents demonstrated a stronger understanding of the increased sensitivity to UV rays that acne treatment products can cause (Mean = 2.722 for females vs. 2.595 for males). Females also reported a higher awareness that acne treatment prescriptions frequently include sunscreens (Mean = 2.873 for females vs. 2.709 for males). However, males showed a slightly greater understanding of sunscreens' role in accelerating the healing of acne and acne scars (Mean = 2.772 for males vs. 2.671 for females). This pattern suggests that, while both genders are knowledgeable, females are generally more informed about sunscreen's preventive benefits in acne care.

Regarding attitudes, females are less likely than males to avoid sunscreens due to concerns about pore clogging (Mean = 1.316 for females vs. 1.544 for males) or fears of worsening acne (Mean = 1.405 for females vs. 1.595 for males). They are also less likely to view sunscreens as less important than their acne treatments (Mean = 1.165 for females vs. 1.380 for males), suggesting that females may see sunscreen as an integral part of their skincare regimen rather than an afterthought.

In practice, females prioritize selecting sunscreen ingredients that help prevent acne (Mean = 2.532 for females vs. 2.367 for males) and are more likely to prefer specific sunscreen brands (Mean = 2.646 for females vs. 2.494 for males). They are also less inclined to stop using sunscreen once their acne is under control (Mean = 1.241 for females vs. 1.418 for males), reflecting a commitment to consistent sunscreen use. These findings indicate a more diligent, product-focused approach to sunscreen among female respondents, emphasizing long-term skincare practices.

Overall, these differences suggest that female respondents tend to be more informed, positive, and consistent in their approach to sunscreen use as part of acne management, while male respondents, though knowledgeable, appear relatively more cautious and less consistent in their practices. This highlights a gendered variation in skincare routines, with females more likely to view sunscreen as a critical component of acne prevention and treatment.

Table 13. Comparing the Response from Different Age Groups

Item	18 - 27	28 – 40	41 and above	Kruskal Wallis (X2)	P-Value
K2. I am influenced by my family and friends regarding the use of sunscreens for my acne.	2.922 ± 0.044	2.818 ± 0.051	2.766 ± 0.061	25.368	<0.01
K3. I know that using acne treatment products alongside sunscreens helps maintain healthy skin.	2.974 ± 0.026	2.935 ± 0.039	2.935 ± 0.039	55.724	<0.01
A2. I am influenced by my family and friends regarding the use of sunscreens for my acne.	2.156 ± 0.089	2.221 ± 0.090	2.260 ± 0.091	26.502	<0.01
A3. I am unlikely to use sunscreen because I am usually in too much of a hurry to apply it.	1.286 ± 0.064	1.403 ± 0.077	1.442 ± 0.077	24.883	<0.01
P2. I purchase sunscreens that are recommended by my dermatologist.	2.688 ± 0.065	2.610 ± 0.064	2.558 ± 0.065	30.800	<0.01
P3. I buy sunscreens that are popular on social media.	1.584 ± 0.062	1.727 ± 0.063	1.662 ± 0.063	32.839	<0.01

Table 13 compares responses on sunscreen-related knowledge, attitudes, and practices across different age groups (18-27, 28-40, and 41+), revealing significant differences in behaviors and influences ($p < 0.01$).

For knowledge, younger respondents (18-27) reported the strongest influence from family and friends regarding sunscreen use for acne, with a mean score of 2.922, followed by the 28-40 group (Mean = 2.818) and the 41+ group (Mean = 2.766). This trend suggests that younger individuals may be more receptive to social influences when making skincare decisions. Additionally, the 18-27 age group displays a slightly higher understanding of the importance of using sunscreen with acne treatments for skin health (Mean = 2.974) compared to the older age groups (both with a

mean of 2.935), indicating a proactive stance among younger individuals on skincare knowledge, especially regarding the combination of sunscreen and acne treatment.

In terms of attitudes, the tendency to skip sunscreen due to busy routines increases with age. The youngest respondents (18-27) are the least likely to avoid sunscreen for this reason (Mean = 1.286), with this attitude becoming more common among the 28-40 group (Mean = 1.403) and the 41+ group (Mean = 1.442). This finding suggests that sunscreen application may be a lower priority for older age groups when time is limited.

Regarding practices, younger individuals (18-27) showed the strongest adherence to purchasing dermatologist-recommended sunscreens (Mean = 2.688), with this practice gradually decreasing in the 28-40 group (Mean = 2.610) and the 41+ group (Mean = 2.558). This reflects a greater tendency among younger respondents to follow expert advice on skincare products. However, younger respondents are also more likely to buy sunscreens popularized on social media (Mean = 1.584), compared to the 28-40 group (Mean = 1.727) and those aged 41+ (Mean = 1.662), highlighting a notable influence of social media on younger users' purchasing decisions, which diminishes with age.

In summary, the data suggests that younger age groups (18-27) are more influenced by social sources and follow both dermatologist recommendations and social media trends closely. In contrast, older groups are less impacted by social or online trends and may deprioritize sunscreen use, especially when time pressed. These age-related differences indicate that targeted educational and social influence strategies could help enhance sunscreen practices, particularly among older individuals.

CONCLUSION

The sample was predominantly composed of younger, educated females, suggesting that this demographic may be more inclined to seek dermatological care for acne. Participants displayed a high level of knowledge about the importance of incorporating sunscreen into their topical and/or systemic acne treatment regimen, recognizing that their skin is more sensitive to UV rays and that sunscreen helps prevent acne scarring.

Although participants generally held positive attitudes toward sunscreen, overall practice scores indicated that while they follow their dermatologist's recommendations, their consistency in sunscreen application remains moderate. Among employment groups, unemployed participants appeared slightly more receptive to external influences regarding sunscreen use, suggesting the potential benefit of targeted sunscreen education for this group.

Notable gender differences were also observed. Female respondents demonstrated a more informed and proactive approach to sunscreen use compared to males, showing greater awareness of its protective benefits and being less swayed by negative perceptions. This suggests that females are more likely to maintain consistent sunscreen application.

Additionally, younger respondents in this study were more influenced by social networks in their sunscreen use and choices. This demographic may benefit from additional guidance from dermatologists to help them select appropriate products.

Overall, these findings emphasize the importance of educating acne patients about the need for sunscreen alongside their acne medications. This education is vital to achieving effective acne management and supporting comprehensive skincare routines.

CONFLICT OF INTERESTS

No relevant disclosures.

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